





2015-03

# Integrating energy efficiency into Navy culture: an organizational design approach

Jansen, Erik

Monterey, California. Naval Postgraduate School


# NAVAL POSTGRADUATE SCHOOL

**MONTEREY, CALIFORNIA**

**INTEGRATING ENERGY EFFICIENCY INTO NAVY CULTURE:**

**AN ORGANIZATIONAL DESIGN APPROACH**

by

Erik Jansen, Ann C. Gallenson, Susan L. Higgins

March 2015

**Distribution Statement**

Prepared for: Navy Energy Coordination Office, OPNAV N45E

## ABSTRACT

In response to the Secretary of the Navy's ambitious energy goals, Navy leadership seeks a shift in Navy culture to shape and sustain energy efficient policies, practices and behaviors across the enterprise. These energy goals and culture shift are expected to result in enhanced Naval combat effectiveness. Culture is a complex phenomenon that can be shaped but not controlled. Leaders use various action strategies to generate commitment to an "energy efficient culture." Overcoming organizational inertia and resistance to change can be achieved in part through an organization's design. We discuss culture change in terms of "sensemaking" and "sensegiving" and the five policy domains of organizational design: (1) strategy and goals, (2) tasks, practices and technology, (3) structure, (4) training and education, and (5) reward systems and incentives. We explore the role of leadership in creating, nurturing, and sustaining cultural changes; our recommendations are incorporated in a "Leadership Checklist for Energy Efficient Cultures" (Table 1). The use of existing training methods to disseminate a new attitude toward energy is reviewed in depth (Appendix A) and in relationship to strategic communication and emergent learning resources such as Massive Open Online Courses (MOOCs). Ultimately the success of a new energy perspective relies on the skills of leaders to provide sensemaking contexts and rewards that promote new behaviors and remove existing barriers to change.

# TABLE OF CONTENTS

# INTEGRATING ENERGY EFFICIENCY INTO ORGANIZATIONAL CULTURE: AN ORGANIZATIONAL DESIGN APPROACH

**ERIK JANSEN**
**ANN C. GALLENSON**
**SUSAN L. HIGGINS**

**Naval Postgraduate School**

In response to the Secretary of the Navy's ambitious energy goals Navy leadership seeks an enterprise-wide shift in culture to shape and sustain energy efficient practices and decisions. The energy goals and culture shift are expected to result in enhanced Naval combat effectiveness. Fortunately, the Navy has successful experience in managing enterprise-wide culture shifts. For example, safety is an "all-hands" effort. The strategic vision of safety has been translated into organizational structures, reward systems, training and education. It is well understood that the Navy mission is enhanced when appropriate safety measures are followed and diminished when safety is disregarded. A similar systems-wide change effort is now underway with respect to energy. While considerable progress has been made, especially at the higher strategic and structural levels, success depends on the extent to which energy efficiency and conservation policies, practices and behaviors spread through the enterprise. Energy efficiency and conservation, like safety, require a force-wide change. Hence, it is not surprising that "culture" is used to describe habits and mindsets that serve as barriers to efficient energy practices and innovations or that a "culture change" is seen as key to turning intent into policy and practice.

Culture, however, is an ambiguous term. "It's the culture" can become a catch-all attribution, resulting in a lack of specificity and clarity about its relationship to practice and performance. We present a framework for conceptualizing culture change based on organizational design. Although the focus is on energy policy, efficiency and conservation initiatives, the framework is useful for understanding other desired culture changes.[1]

***Organization of the Paper***. We begin with a definition and selective overview of organizational culture, culture change, and resistance to change. We then present a model[2], which comprises five organizational design and policy domains that must be systematically addressed in order to overcome resistance to culture change. The five domains are: (1) strategy and goals, (2) tasks, practices and technology, (3) structure, (4) training and education, and (5) reward systems and incentives. We contrast training and education in terms of how they each relate to larger structural issues of organizational design. We highlight the role and limitations of brief training experiences such as

---

[1] Because this paper was created largely within the context of formulating General Military Training (GMT) on energy for the Department of Navy, design considerations regarding training and education are covered in Appendix (A) in more depth than other design factors

[2] This model is based on Jay Galbraith's (1995) Star Model.

General Military Training (GMT) to promote culture change. Throughout the paper we discuss implications for leadership and management. We provide a high-level checklist for leaders to use to assess the status of their culture change initiatives

## ORGANIZATIONAL CULTURE AND CULTURE CHANGE

### ORGANIZATIONAL CULTURE: SENSEGIVING AND SENSEMAKING

Organizational culture is a complex, highly abstract construct (like leadership or organizational structure) that is rich with what philosophers of science call "surplus meaning." The idea of culture carries different associations for different people, and this makes it a simultaneously rich but ambiguous idea. The literature on culture offers diverse definitions that include "shared guiding beliefs, understandings and ways of thinking" or "shared meanings", "mental models", "root metaphors", and "group norms."[3] The core concept underlying these definitions can be described as shared assumptions. We define culture as *"the set of important assumptions (often unstated) that members of a community share in common."*[4] We cannot directly observe assumptions, beliefs, thinking, mental models, or shared norms, and so we cannot directly observe culture. Culture must be inferred by "shared things, shared sayings, shared doings [or behaviors] and [expressions of] shared feelings,"[5] Thus, deeper assumptions that reveal a safety culture or an energy efficiency culture are revealed by what people say and how they say it, by what they do and how they do it, and by the objects and symbols they surround themselves with. These sayings, doings and things are at the surface of a proverbial iceberg. It is the deeper shared meanings, values, and assumptions that account for the hidden weight of culture and its impact on producing repetitive, reliable self-maintaining and self-stabilizing actions.

Culture is the "set of important assumptions (often unstated) that members of a community share in common."

Culture is thus often viewed as comprising deep elements that constrain and direct the sayings and doings of organizational members. A more recent but complementary view of culture likens it to a "tool kit." In this view, people combine the elements of culture into "strategies of action" that actively inform their behavior and choices. Thus, culture not only constrains, it enables. From mandated or technologically required new routines and practices, people learn and recombine these elements to generate a new cultural gestalt and new action strategies. In this view, the role of leadership is to "provide members with narrative resources to make sense of new practices [that are] compatible with core organizational values and/or encourage a revision of foundational and distinctive goals and values in terms that are coherent with the expected outcome of the

[3] Schein E. H., 1992, pp. 8-10.
[4] Sathe, V., 1985, p. 10.
[5] Sathe, V., 1985, p. 17.

new practice."[6] Individuals are active, "sensemaking" agents, and leaders play an important "sensegiving" role. They do this through the narratives and stories they tell, by the rationales and reasons they provide, and through their personal actions, which are continuously observed by those they lead.

## CONTROL, COMMITMENT, AND SYMBOLIC LEADERSHIP

Of the many ideas related to culture, we call out three that are especially important for understanding culture and culture change: control, commitment, and symbolic leadership.

***Control.*** Culture as control is revealed by norms, which are shared understandings and expectations about the appropriateness or inappropriateness of certain behaviors. These may be promoted through shared stories and are referenced in phrases such as "learning the ropes". Groups regard individuals who do not act appropriately and who fail to correct their behavior in the face of subtle or not so subtle peer feedback as deviants, who risk being isolated or ostracized by the group. Thus, a strong culture is maintained by peers and is self-regulating. If its values and goals are aligned with those of the organization, it relieves the pressures on leadership to observe, monitor and control their people. On the other hand, if cultural values and goals are not aligned with organizational goals, they become a frustrating source of inertia and resistance. The importance of culture as a control function is revealed when we emphasize the importance of the "informal organization".

A strong culture is maintained by peers and is self-regulating. If cultural values are not aligned with organizational goals, they can become a source of resistance.

***Commitment.*** Commitment is most relevant to understanding the psychology, intention, and behavior of individuals. Commitment is commonly defined as a state in which a person identifies with an organization's goals and values and is thus highly motivated to contribute to its success.[7] Commitment attends to the deep acceptance of an organization's values, norms, and beliefs and thus the internalization of culture.[8] Leaders who seek culture change are also seeking commitment on the part of organizational members. It is possible for culture change efforts to produce only superficial behavior

---

[6] Canato, A., Ravasi, D., & Phillips, N., 2013, p. 1749.

[7] Mowday, R.T., Porter, L/W., & Steers, R.M. (1982). Employee-organization linkages: The psychology of commitment, absenteeism, and turnover. New York: Academic Press.

[8] O'Reilly, C.A. & Chatman, J. 1986.

change that amounts to a "resigned compliance"; in such cases, because of a lack of deeper commitment, the behavior change is not expected to persist.[9]

***Symbolic Leadership***. As the "tool kit" metaphor of culture indicates, culture involves a number of elements, including shared assumptions, meanings, values, mindsets, perceptions, and norms. These all enter into the sensemaking processes of individuals and groups. Leaders influence sensemaking through sensegiving: they communicate narratives, stories, and their understanding in order to move the outcomes of the sensemaking process toward a "preferred redefinition of organizational reality".[10] This is a function of "symbolic leadership", which is concerned with how people interpret and make sense of what is happening around them. Symbols can also include awards, images, and narratives celebrating achievements or criticizing inappropriate actions; words are among our most powerful tools and symbols. Because culture change involves recombining cultural elements to support new assumptions, leadership's role is critical.

Leaders redefine new cultural realities by communicating through narratives that include awards, images, and celebrations of achievements.

***The Context of Culture and Culture Change***. Culture change is often viewed as a catch-all because it is a gestalt of many elements that are influenced by so many other factors in the organization. Figure 1 shows culture as an emergent phenomenon involving the combination of elements that are influenced by five sets or domains of design factors and by symbolic leadership. The model emphasizes the criticality of culture by presenting it as mediating between the effects produced by management's design and policy decisions and the organization's performance. Organizational performance thus depends on culture; it also becomes the context and stage for leadership's policy, design and symbolic leadership roles and actions.

Culture emerges from a combination of strategy, practices, structures, goals, rewards, training and education.

[9] Sathe, V., 1985; Schein, E. H., 1992.
[10] Gioia & Chittipeddi, 1991, p. 442.

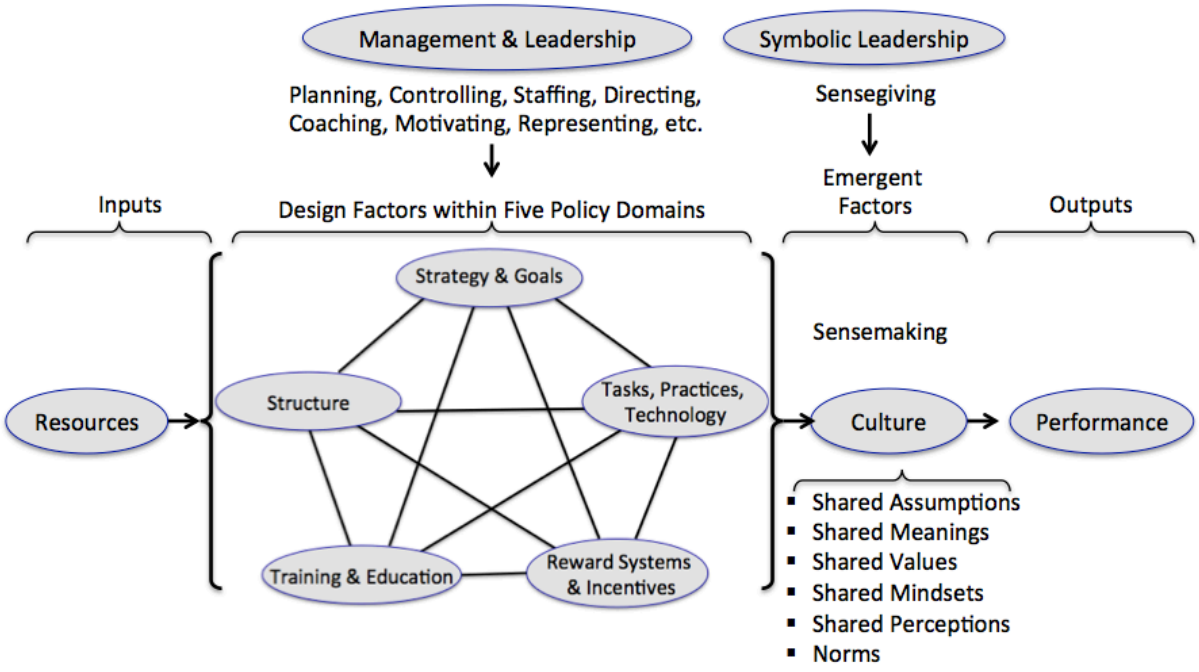


Figure 1: An Open Systems Organizational Design Model: Culture viewed as Emergent Elements Co-Produced by Symbolic Leadership and by Design Factors within Five Policy Domains.

Figure 1 shows that culture emerges from the design factors that form a central star in the figure: strategy, practices, structure, rewards and training and education.[11] These five domains comprise "design factors" that senior management and leadership effect through policies and decisions made in the course of exercising various functions, including planning, controlling, staffing, directing, coaching, motivating, and representing. These more formal policy levers, along with symbolic leadership and sense giving, are the major means available to leadership for overcoming resistance to change.

Figure 1 is an "open systems model". Open systems depend on and shape their environments. The organization receives critical inputs: tools, equipment, technology, materials, land, capital, information, knowledge and energy. It survives and persists by transforming these into valued effects or outputs usually described as products or services. The effects of many military missions involve transforming the environment by, for example, defeating those who represent security threats, preserving the security of sea-lanes, or providing relief or rescue from natural disasters. Effectiveness is generally associated with outputs, but the internal processes of the organization can also be judged

[11] Our model is adapted from Galbraith's (1995) star model. The model is not all-inclusive. We focus more on culture – particularly in the context of energy efficiency. The model also highlights the training and education aspects of "people practices." Thus we do not deal with issues of recruitment, selection, placement, and retirement that his model would be more likely to call out.

as more or less effective in contributing to organizational goals. Internal processes are frequently judged in terms of efficiency, or getting the most out of given levels of inputs.

## RESISTANCE TO CHANGE

Behavior change can occur without culture change, and can thus mask a deeper resistance to change. In addition, resistance to change is not always the result of conflict with the values and assumptions of an emerging or established culture. People may resist changes in procedures or organizational reporting relationships or the adoption of new technologies because it requires them to learn new skills, threatens their status, or threatens their personal work relationships. Because these are generally not viewed as acceptable reasons for objecting to change, people may search for more substantive justifications for their discomfort and resistance.

However deep or superficial the causes of resistance to change, leaders must overcome resistance to implement important culture changes in areas such as safety or energy efficiency.

Behavior change without culture change is likely to be short-lived. A common strategy for resisting culture change – particularly in public bureaucracies or military organizations where leadership may change frequently – is to wait out a leader to see if subsequent leaders continue to support culture change efforts. Persistence across and among leadership is especially important in large, public-sector bureaucracies with high leadership mobility and political agendas at the highest level. Thus, the first level of change that challenges large public agencies is within the strategic apexes of their own functional silos. Note that resistance can appear not only active conflict and opposition but also as members' ignoring new priorities and "maintaining the course".

A simple model for overcoming resistance to change can be given by the following equation, which serves only as a heuristic[12]:

**Resistance to Change < Motivation x Ability x Role Clarity x Change Methods**

In this formula, Motivation is the motivation to change, which includes both extrinsic motivation and intrinsic motivation. Ability also includes the knowledge and skills necessary for making the requisite changes. Role Clarity is the opposite of role ambiguity; it represents the expectations that members have about the actions of those in specific organizational roles. Change Methods refers to the approach and action strategies (e.g., participative discussions and/or General Military Training) used by management, leadership and their representative change agents. The interaction of the terms is indicated by multiplication signs. In this heuristic formula, if any one of the four terms is zero, then their product will be zero, and there will be no force for overcoming resistance to change. The change methods are discussed below in terms of the five points of the star model.

---

[12] This is developed more by Sathe (1985); the presentation is modified somewhat. Some readers will recognize its similarity to the theory of planned change and expectancy theory.

Not all individuals in organizations are resistant to change. In the case of an energy efficient culture, as with the case of a safety culture, we can expect to find individuals who are willing and able to join, support, lead and champion the change efforts. Others are willing but not sure how to make a contribution. Some hear the words but don't understand the emerging combination of elements that is forming something akin to a new paradigm of thought. Of course, some individuals are genuinely resistant to change to a greater or lesser degree, and they may be continuing sources of inertia for shorter or longer time periods.

***Motivation to Change***. Motivation is associated with goals and goal attainment. It thus is a factor in the choices made and the action strategies that are activated. Greater motivation results in greater effort and persistence in the face of barriers. Motivation is of two types: extrinsic and intrinsic. Organizations activate extrinsic motivation primarily through the formal reward system (e.g., pay and benefits, formal recognition and awards programs, and promotions) and leadership actions (e.g., informal and formal recognition and personal feedback). Intrinsic task motivation can be generated by thoughtful job and work design, including the design of tools and technology. For example, information displays (sometimes called "dashboards") can provide immediate feedback on progress toward and achievement of energy goals, and thus motivate energy efficient behaviors.

Intrinsic personal motivation is related to the deep values individuals have; it is associated with "standing tall" and feeling proud versus feeling guilty or ashamed about one's actions; it is thus connected to one's sense of self (or ego) and deeper value commitments. Individuals who are committed to energy conservation as the right thing to do because they personally value combat effectiveness are likely to be more intrinsically motivated to adopt new strategies to promote energy efficient actions. Leaders can help by sharing stories of how combat effectiveness is enhanced through energy efficient practices.

Leaders can help shape the Navy's culture by sharing stories of how combat effectiveness is enhanced through energy efficient practices.

***Abilities, Skills, and Knowledge to Support the Change***. Even with high motivation, individuals will not be able to execute new behaviors unless they have the requisite abilities, skills and knowledge. Training, including on-the-job training, and education are the primary means of generating relevant abilities, skills and knowledge.

Individual motivation is also influenced by the perception individuals have of their own abilities, skills and knowledge to perform new, relevant behaviors. Without minimum self-efficacy, people do not believe that effort will be translated into performance. This motivational factor is largely – though imperfectly – a function of the actual abilities, skills, and knowledge that are actually possessed.

***Role Clarity***. Ambiguity or conflicting expectations regarding roles lead to misdirected actions. Roles differentiate individuals in terms of their functions and what is expected from them in terms of social behaviors and interactions[13]. Successful culture change requires that people are clear about what is expected of them in terms of new behaviors and interactions. It is not sufficient for people to be motivated and to have the abilities if they are not clear about what is expected of them.

Generating and sustaining new cultures requires a systemic approach of integrated policies and methods.

***Methods of Change Employed by the Organization***. The policies and methods adopted by leadership are critical in overcoming the resistance to change. The choices leaders make regarding which design factors to use to leverage change and how to time the implementation of those factors are critical. Because organizations are complex, political entities, it is rarely possible, especially with large organizations, to simultaneously move forward on all fronts. Hence, some factors and policies are necessarily viewed as leading factors and others as lagging. Typically, strategic thinking and communication are leading factors, followed closely by structural actions involved in creating new roles, responsibilities, task forces, and organizational units. Training and education for higher-level leadership often precedes that of lower level leadership, staff, and operational personnel. Resistance to change is best overcome when savvy managers who understand their own organization's mission, technologies, people, and existing culture carefully orchestrate the design and policy domains required for culture change. Often culture change, seems to be as much – or more – art as the systematic application of design and change principles.

Successful culture change requires that people are clear about what is expected of them in terms of new behaviors and interactions.

## ORGANIZATIONAL DESIGN, POLICY DOMAINS, AND CHANGE METHODS

Figure 1 illustrated an open systems model of organizational design and organizational culture. In this view, culture is regarded as an emergent set of phenomena comprising elements that people recombine in adaptive, creative ways to develop action strategies resulting in behavior. It emerges as a result of factors that can be organized into different organizational domains. Figure 2 illustrates these five domains and several of the most important factors within each of them. The methods of change, discussed above, that serve to overcome cultural inertia and resistance to change also can be conceptualized in terms of these five policy and organizational design domains.

---

[13] Whereas roles differentiate and are related to the division of labor, norms serve to integrate the diverse roles that make up an organization's structure.

Strategic organizational design emphasizes that the likelihood of organizational effectiveness and goal accomplishment are increased when the factors that make up these five domains are congruent with each other. It is also increased when they additionally aligned with the vision, purpose, mission, goals and objectives of the organization. In this section we give a short description of the factors relevant to these domains. We present a few corresponding leadership implications and suggest how these factors relate to organizational assessment (e.g. survey construction to assess progress on energy policy implementation and culture change). Because this project began with a focus on training and education, special attention is devoted to this domain in Appendix (A).

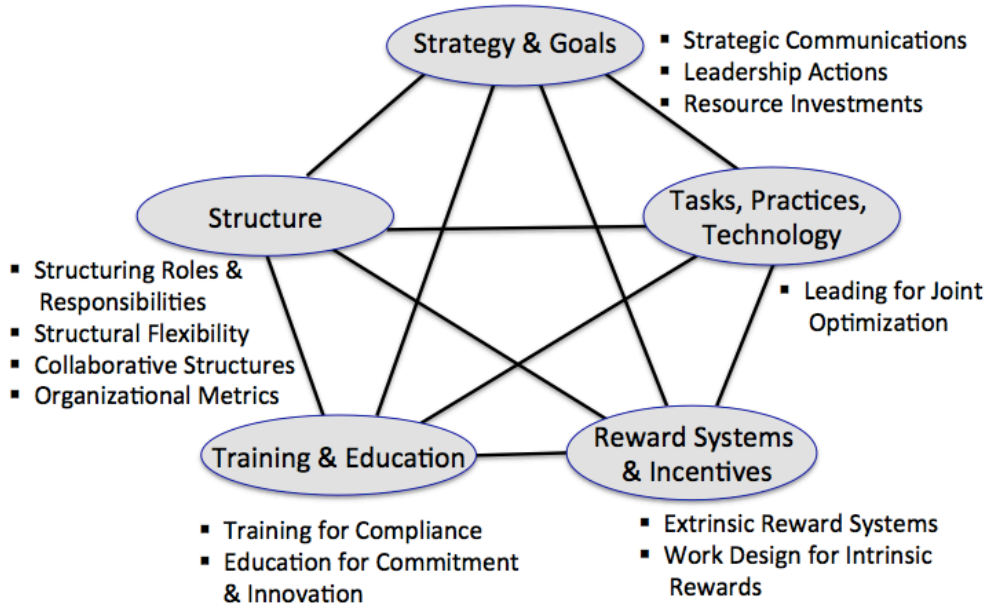


Figure 2: Twelve Design Factors Organized within Five Organizational Design/Policy Domains.

In Table 1, a checklist is offered with "bottom line" descriptions of design factors that are viewed as requirements to generate and sustain culture change. These are discussed in the sections below, and are illustrated in Figure 2.

There is not sufficient research to know if some factors can be ignored because others can substitute for them or about which factors should be initially used to lead the change (vs. those that can lag behind and be changed later).[14] The general wisdom – both among

[14] Because practitioners seeking important changes use systemic approaches that introduce multiple factors across units, it is difficult or impossible to discern what factors have the most impact on culture change. When many levers are pulled, it is unclear what levers are responsible for particular effects. In order to understand factors or combinations of factors is most likely to

organization design theorists in academia and practicing managers – is that generating and sustaining new cultures requires a systemic approach of integrated policies and methods.

## STRATEGY, GOALS, AND CULTURE CHANGE

Because strategy sets the context for change and clarifies goals, it generally comprises a critical set of leading (rather than lagging) factors for change. Strategy is a necessity given that the organization is an open and purpose-driven system that exists within an ecology of other systems. Leadership and management at the highest levels – the strategic apex – are responsible and generally held accountable for establishing the purpose, strategy, missions, and goals of the organization. This involves analyzing the strengths and weaknesses of the organization as they relate to the threats and opportunities in the environment, understanding relevant stakeholder interests and positioning the organization with respect to its environment. It is in this context – one involving the highest levels of government – that Navy energy policy is being created. A clear determination has been made that energy inefficiency can cost lives and can threaten mission success[15]. Thus, the fundamental values and assumptions of combat effectiveness require a higher strategic prioritization of conserving the scarce resource of energy.

The fundamental values and assumptions of combat effectiveness require a higher strategic prioritization of conserving the scarce resource of energy.

Fortunately, Navy leadership does not need to overthrow core values of the organization for new values. As with safety, the Navy's most central values of honor, courage and commitment align well with energy efficiency and conservation. However, in each of the Navy's unique sub-cultures, leaders and followers will have to actively integrate and make sense of how the elements that constitute their own culture must adjust to embrace the new values of energy efficiency and conservation. The frustration some strategic leaders feel when the primary push is expressed in terms of saving money versus increased combat effectiveness and likelihood of mission accomplishment reveals the subtleties involved in making sense of what a culture of energy efficiency is. What is obvious to some may elude others.

**Strategic Communication for Energy Efficiency**. In the absence of a "felt need for change"[16] or a "sense of urgency"[17], individuals are likely to maintain their current

---

impact organizational change, we require research designs that systematically compare different change methods and strategies.)

[15] The relationship between mission success and access to energy is not a new phenomenon, as the Africa campaigns between the Axis and Allies in World War II most clearly demonstrates.

[16] Jick, T., 1993, p. 128.

[17] Kotter, J. P. 1996.

mindsets, ways of attending and perceiving, and behaviors. Strategic leadership must work to generate change through strategic communication. This may be done informally or more systematically. A systematic strategic communication process requires that top management analyze stakeholders' core assumptions and interests in order to understand how to craft a communication strategy that is most likely to generate commitment among critical (and pivotal) stakeholders. It also aims at minimizing or neutralizing opposition from those opposed to the changes. In this context, change can be viewed in terms of network contagion models[18]. Because organizations are complex networks of relationships among actors – some involving formal authority, some involving expertise, some involving trust – the diffusion of change is likely to be a complex, dynamic process, rather than a linear, reductionist process. However, a focus on the hierarchical chain of command might suggest the latter. Strategic communication helps prioritize actions that have a higher communicative impact as it shapes the message content in terms of stakeholder assumptions and their likely sensemaking processes. It serves leaderships' sensegiving challenges and opportunities. Strategic communication can help not only in crafting the content of messages with respect to assumptions about sensemaking and meaning, but can help prioritize actions that have higher communicative impact.

If a leader delegates actions on energy to subordinates without also actively and visibly supporting those efforts, they may be communicating that energy efficiency is a low priority.

Strategic communication is revealed when the leaders at various levels have a planning process and a strategic plan for communicating and implementing energy strategy. Strategic leadership regularly and visibly communicates goals and priorities; they make the necessary resource investments – within their discretion – to support energy policy and best practices. The results of strategic communication are revealed by the degree of familiarity, understanding and support for energy goals demonstrated by an organization's members.

**Leadership's Commitment to Energy Efficiency**. From a cultural perspective, symbolic leadership serves an interpretive role involving narratives and sensegiving. A leader's presence and involvement is a strong force for directing the attention of organizational members and communicating their own deep commitments, including what tasks are low priorities. For example, if a leader delegates actions on energy to subordinates without also actively and visibly supporting those efforts, then they may be communicating that energy efficiency is a low priority. Cultural theorists view leaders as critical to overcoming inertia and speeding the pace of culture change. [19] Leaders do this as role models and as coaches to lower level leaders, staff, and operational personnel.

---

[18] Monge, P. R. & Contractor, N.S., 2003.

[19] Schein, E.H., 1992.

When practices conflict with culture, leaders can affect change not only by exercising the authority and power of their position, but also through the exercise of personal power, which includes their expertise and presence as role models.

**Resource Investments in Energy Efficiency**. Strategy is largely about the prioritization of important goals and values that reveal themselves in resource investments of time, energy, and money. Such investments may be powerful evidence regarding leadership's level of committed to energy efficiency policy and goals.

Resource commitments can be made for changing any of the five policy domains in the above model. At various levels of the hierarchy, the emergence of an energy culture depends on investments and the perception of investments in facilities, equipment, information technology, training and education, and additional billets or liaisons dedicated to energy efficiency. Creating and sustaining an energy efficient culture is likely to depend on training and educating personnel on alternative energy technologies and contracting or developing the talent for effectively using those new technologies. In parallel, training may include helping personnel develop new practices using the existing technologies.

## TASKS, PRACTICES, TECHNOLOGY AND CULTURE CHANGE

Groups and organizations involved in different types of work – different tasks and practices – tend to develop different subcultures. Navy examples include aviation and surface warfare communities. Different specialists internalize different values partly because of their work and work practices. When new tasks and practices are required of groups and organizations, values, assumptions and culture must adapt.

Tasks are activities with a purpose. Practices are more broadly defined as sets or bundles of behaviors, routines, concepts and tools that serve to accomplish a purpose.[20] Tasks and practices depend on technology and technical systems, which include the physical equipment, tools, communications and information systems, and "systems of systems" made popular by systems engineers. Practices are dependent on technologies.[21]

In the context of culture change, "cultural fit" is the degree to which new technologies and practices fit the assumptions, priorities, mindsets, and values of the existing culture. Transitions in energy or information technologies require shifts in social behaviors and technical practices. The degree to which these violate current cultural assumptions impacts the success of implementing new technologies. Leaders expecting

The critical lesson for leaders is to – as far as possible – involve the work force in the design and implementation of new practices and technologies in the organization.

[20] Westphal, J. D., Gulati, R., & Shortell, S. M., 1997

[21] The classic definition of "technology" is "the process for transforming inputs into outputs." By such a definition, technologies depend on and include practices.

productive implementation of new technologies must therefore realize that social and cultural misfit can undermine their expectations. This discovery is behind the principle of joint optimization of both the social and technical organizational systems.

***Leading for Integrated Optimization***. In the early 1950s, the "socio-technical systems approach" emerged when field researchers discovered that engineering approaches that focused on optimizing efficiency through new technologies failed to meet goals because social and cultural issues had been ignored.[22] The researchers coined the term "joint optimization" to describe and advance a new, critical design principle: optimizing only one component of an organizational system (social-cultural or technical) risks introducing non-linear, complex dynamics that can undermine motivation, commitment, and productivity. (We use the term "integrated" to distinguish it from the common use of "joint" in a military setting as multi-Service operations.) The critical lesson for designers and leaders is to – as far as possible – involve the work force in the design and implementation of new practices and technologies in the organization. This is especially critical in the context of complex and sophisticated work requiring more knowledge and expertise. Leaders who ignore the social and human side of change as they implement new practices and technologies risk getting "resigned compliance"[23] from their workforce instead of commitment. The worst-case scenario is a vicious cycle that begins with blaming and alienating the workforce and leads to increased alienation and resistance to new practices. Perhaps more common is a change process that unfolds more slowly because the social side of the socio-technical problem (e.g. changes in status, disruption to individual routines and group rituals) has not been thought through.

Optimizing only one component of an organizational system (social-cultural or technical) risks introducing non-linear, complex dynamics that can undermine motivation, commitment, and productivity.

Therefore, in implementing new practices and technologies, effective leadership works to understand the social and cultural challenges that can become barriers to change. They consult with members, inviting their participation when challenges arise.

## STRUCTURE TOWARD COHERENCE

The historical core of organizational design has been on the formal, "objective" organization.[24] The structural perspective focuses on design decisions involving

---

[22] Cf. Van Eijnatten, F.M., Shami, A.B. & Leary, M.M. in Cummings, T.G. (Ed.) 2008.

[23] Ogbonna, E. & Harris, L., 1998, p. 285

[24] "Objective" is in quotes because of the ambiguity of the term and the agreement that organizations are human artifacts designed, created and interpreted by people; their meaning is

departmentation and authority structures, centralization versus decentralization, formalization, and standardization. At the core of these various issues – and thus of organizational design – is the challenge of appropriately dividing up work responsibilities for various tasks and practices and then coordinating them so "the right hand knows what the left hand is doing". The challenge of organizational design is accomplishing this so that structural factors mutually reinforce each other, are coherent with factors in other domains (e.g., training and education and reward systems) and are aligned with the strategy and mission. Creating such coherence and alignment increases efficiency and the probability of mission success. Failing to create coherence and alignment increases risks leading to inefficiencies, high costs and potential mission failure.

The challenge of organizational design is to coordinate so that the right hand knows what the left hand is doing. Structural factors such as goals, rewards, training, and education should mutually reinforce each other.

Four structural design factors are especially relevant in thinking about an energy culture. The first three refer to structural "realities"; the last is different in that involves assessment and thus refers to indicators of realities. These are summarized in Table 1 and briefly discussed below.

***Structuring Roles and Responsibilities***. Roles[25] are the expectations that people have of how others will act and perform in the context of other actors performing their roles. Roles are associated with tasks and differentiate people and their contributions. Some jobs have multiple roles. For example, a Navy Lieutenant may be a Department Head, a Command Duty Officer and an Energy Manager. Role clarity involves understanding the responsibilities, authorities, and obligations of roles. The resistance to change formula (discussed above in the section on "Resistance to Change") indicates that culture change often involves changes in expectations about how people are expected to act, what their responsibilities and obligations are, and how they relate to other roles.

Changes in technology, work tasks, and practices can also change the roles and status of individuals. Individuals' status and power are diminished to the degree that others depend less on them for information or resources. In the case of disruptive innovations, expertise and knowledge that was central to success may become obsolete, forcing individuals to learn new skill sets to be relevant.

---

thus a matter of interpretation and continuing construction. This is why culture, sensemaking, and sensegiving are so important to change and policy implementation. While strategic leadership may find it objectively obvious that energy efficiency is compatible with and supportive of combat effectiveness, the perceptions of many do not see this as an objective fact. Hence the need for culture change that includes an emphasis on individual interpretations as well as a fact-based, evidence-based approach.

[25] We refer to formal roles and formal expectations as opposed to informal roles, which are important but emerge in the context of culture.

Organizations differ in their capability to restructure roles to fit the requirements of new ways of working, including the introduction of new technologies and complex technological systems. In bureaucracies this is often hindered by formalization and standardization. Leaders must struggle and persist against individual habits, group routines, existing roles, and existing rules to make changes. (In the most extreme instances, structural changes in government may literally require an act of congress.) The authority and capability of leadership to restructure roles may be quite limited in the short term, requiring laborious, long-term efforts to make lasting changes. Changes successfully made in the short term may be lost to inertia if subsequent leaders don't follow up with their own commitments for restructuring.

Change requires that leaders throughout the hierarchy not only engage in directive leadership but also provide mentoring and coaching on role expectations, including guidance on how to think of tradeoffs, solve problems, and make decisions in ways that optimize energy efficiency and enhance combat effectiveness. This is required so that changes become part of the self-regulation associated with intrinsic motivation, commitment, and culture.

Change requires that leaders provide mentoring and coaching on role expectations, including guidance on how to think of tradeoffs, solve problems and make decisions in ways that optimize energy efficiency and enhance combat effectiveness.

***Structural Flexibility***. All bureaucracies depend on rules and standard operating procedures (SOPs) to one degree or another. Large organizations and mature, older organizations become bureaucratic. Government depends on formalized, standardized bureaucracy to minimize political influences based on factors unrelated to the merit of particular cases. Cultural change and adaptation are faster and the risks of backsliding are less when the organization is responsive and flexible in changing or eliminating SOPs and rules that create resistance to change. Thus structurally flexible organizations are more likely to support behavioral and cultural change because they can de-conflict policies, processes and procedures, and they can quickly form and modify partnerships as requirements change. When regulations and rules are identified as impediments to growing and enhancing an energy culture, leaders can help by supporting the efforts of those who seek to modify or eliminate outdated policies and procedures.

***Collaborative Structures***. Collaboration emphasizes the importance of partnerships, of horizontal or lateral relations within organizational departments. Sometimes success depends on collaboration and partnering with individuals and groups in other organizations. Although collaboration can be costly in time and effort, it has payoffs where sharing knowledge, best practices, and points of view are important. Coordinating with other units and making sure that members in important boundary spanning roles have strong work relationships across departments often improve innovation and organizational learning. Such collaboration can be face-to-face, as in conferences or training workshops, or mediated through teleconferences or web portals.

In complex, sophisticated organizations, inertia and resistance to change occur when units and organizational partners – perhaps because of limited formal mission statements and metrics for assessing these – engage in competition and conflict that interferes with developing new cultural values (e.g., a culture of energy efficiency that contributes to combat effectiveness).

Coordinating with other units and making sure that members in important boundary spanning roles have strong work relationships across departments often improve innovation and organizational learning.

***Organizational Metrics***. Metrics should be applied to strategic goals and missions; assessing best practices, evaluating the effectiveness and efficiency of training and education, and assessing individual performance. Metrics formalize the organization's performance standards. They also are important to the factors of strategy and reward systems because they become a yardstick against which the organization, its units, and its leadership are judged. They serve to provide information as feedback to leadership, management, staff, and operational personnel; feedback of metrics on efficiency of energy usage has been demonstrated to be a powerful factor in changing individual behavior and energy practices.[26]

## TRAINING AND EDUCATION FOR CULTURE CHANGE

Training and education are critically important for overcoming resistance to change. We discuss these in more depth in a Appendix A, as these were a primary focus for our team when we designed the Energy General Military Training (GMT). We also considered other options such as Internet based individual learning paths (e.g., Massive Open Online Courses (MOOCs)) that might serve as more compelling, innovative vehicles for advancing culture changes with respect to energy conservation and efficiency. Appendix (A) provides a more detailed discussion of standard Navy training practices vs. emerging education platforms, such as MOOCs.

Massive, Open, Online Courses (MOOCs) might serve as compelling, innovative platforms for advancing culture changes with respect to energy conservation and efficiency.

Training and education can be regarded as being two ends of a continuum. At one extreme, training can be a single, short module delivered in the context of GMT, which might involve an hour or less of time, information presented through a computer interface, and a few questions to assess learning and comprehension or to provoke further thought. This is a mechanistic, standardized process: one size fits all At the other extreme, education can involve years of higher

[26] Lo, S. H., Peters, G-J.Y. and Kok, G., 2012.

education, advanced degrees and certificates of specialization, internships, on-the-job training, and requirements for continuing education. When the work requires much education (e.g., physicians or lawyers), organizations depend on recruitment and selection processes rather than running their own in-house educational institutions. An exception involves the military professions, with the U.S. Naval Academy and the Naval Postgraduate School being examples of institutions within DoN's structure that also meet the highest standards of accreditation by independent academic bodies. If the education experience is limited to what can be delivered on-line, through a computer interface, then education can be described as "individual learning paths". The experience may be standardized in terms of modules but may have room for peer interactions and interactions with mentors or teaching assistants. MOOCs are a currently emerging (and morphing) example of individualized learning paths. These on-line alternatives for training and education are discussed in the next major section of the paper. In this section, we discuss the general fit of training versus education in culture change.

***Basic Training for Compliance and Appreciation of Energy Efficiency.*** Organizations require basic levels of training to cover information and knowledge everyone is expected to know. These include important procedures, rules, and basic expectations regarding the behaviors of organizational members. They support the learning of basic knowledge required because of a legal and regulatory context. Training tends to focus on compliance.

A "transfer of training" problem exists in many situations because the reward system and incentives fail to reinforce newly formed behaviors.

Because training is often short, it is well adapted for simpler, basic skills and role expectations. (This does not mean these simple skills are unimportant!) When complex and sophisticated skills and practices must be learned, extended training and indoctrination (or enculturation) of values becomes more important. Training that is immersive – twenty-four hours a day, seven days a week, as in military basic training – is likely to have a strong socialization and indoctrination side to it, although the experience remains standardized. Peer dynamics are important for building cohesion that generates strong pressures for accepting norms. When training includes transmitting knowledge about the organization's history or heroes, it becomes a vehicle for transmission of values and expectations of appropriate behaviors. However, training still tends to be standardized, emphasizing compliance and conformity. If much of what is included in a Navy energy culture primarily requires that individuals develop habits of compliance, then training may be a best fit solution for such circumstances. Learning to turn off the lights is arguably more behavior change than deep culture change, although the example illustrates the argument that all practices are value laden.

A "transfer of training" problem exists in many training situations. This occurs when people learn new behaviors, skills, and attitudes in a training environment, but that learning fails to be adopted or transferred to the work environment. This often is because the reward system and incentives in the environment, which are critical for the performance of learned behaviors, fail to reinforce the newly learned behaviors. In terms

of resistance to change, training shapes new attitudes and behaviors, but the reward system fails to create motivation and strengthen or reinforce new behaviors; therefore, organizational resistance to change is not overcome.

***Education for Commitment and Education.*** When the missions, tasks and problems confronted are diverse and complex, but can be engaged using established methods and bodies of knowledge, then longer, individualized learning paths become critical. Investments then must be made to support higher educational standards, and higher levels of professionalism (i.e., education for making judgments versus executing standard operating procedures) are required. Education must focus more on the art and practices of tailoring solutions for specific contexts. In sum, professionals and subject matter experts are expected not only to know how to execute complex practices and procedures, but how to solve unexpected, complex problems that emerge.

Thus, in complex, diverse, dynamic environments, education is more cognitively demanding and has more of an opportunity to impact how people interpret their world. Because value aspects are learned over time in the context of discussions with instructors and peers, students have time to reason and integrate elements of the training into their own thinking. This kind of educational experience is common to executives and higher-level managers involved in culture change. Whether the values and practices introduced involved are safety, lean-six-sigma, or energy oriented, commitment at higher levels comes from peer discussion, problem solving, and plans for transmitting the new practices to the larger organization.

Culture change often involves the creation of new specialties and billets. Such individuals will require education that includes issues of energy technology as well as leadership and organization skills for effectively implementing broader energy solutions.

The balance of training and education for changing culture – for thinking through the levels and positions that require commitment and a more professionalized work force versus training and a compliant workforce – is an important issue in culture change.

## REWARD SYSTEMS, INCENTIVES AND CULTURE CHANGE

Reward systems function to attract, motivate and retain personnel. The motivational function is viewed as aligning individual and organizational goals. As Kerr noted, organizational dysfunctions arise in contexts where leadership hopes for one set of behaviors (e.g., safety or energy efficiency), but fail to reward them and/or reward alternative behaviors. Kerr notes that it is folly when we "reward A while hoping for B".[27]

The reward system is important for overcoming resistance to change through motivation. A functional reward system connects desired behavior to valued rewards and incentives. (Incentives are simply the promise of future rewards.)

***Extrinsic Rewards***. Extrinsic rewards are sometimes called external rewards. They are external to the individual and the work itself. Examples include pay and bonuses,

---

[27] Kerr, S. 1995.

benefits, promotions and desirable assignments, awards and medals, and approval and feedback from superiors. Reward systems are designed to make valued rewards contingent on desirable behaviors. The reward systems perspective argues that energy efficient behaviors and attitudes are likely to gain strength where they are visibly tied to positive individual outcomes.

It is not only the people who receive rewards directly who are affected by a well-designed (or dysfunctional) reward system. Those who directly witness the new behaviors being rewarded also learn that there has been a change in what is noticed, expected and rewarded. In addition, those who neither experience nor observe the positive consequences of new behaviors learn through stories shared about "who gets ahead" and "who gets recognized". The reward system for delivering extrinsic rewards thus has a powerful impact on culture, because people base their action strategies on their expectations of what behaviors are likely to be approved and rewarded, ignored, and punished or disapproved. This is one reason that celebrating and publicly rewarding energy efficient behaviors are powerful means of changing culture.

Those who directly witness the new behaviors being rewarded also learn that there has been a change in what is noticed, expected and rewarded.

The Navy has long taken advantage of rewards and incentives, both for individuals whose achievements are publicly celebrated, and in terms of competitions between units who earn "bragging rights" and awards. The Navy is beginning to continue this tradition in the domain of energy by including energy in the prized "Battle E" award and by highlighting energy early adopters in the Energy Warrior campaign [28]

### *Intrinsic Rewards*

There are two types of intrinsic rewards: intrinsic task rewards and intrinsic personal rewards.

***Intrinsic task rewards*** are inherent to performing the work itself. An energy professional might find it intrinsically interesting and motivating to do a good job of managing shore installation facilities in the most efficient manner possible. Intrinsic task motivation also applies to leaders who enjoy the art of influencing their people to adopt new energy efficient actions. Organizations often take advantage of intrinsic motivation by trying to fit people to work that they find interesting and that they value. (This is particularly helpful in retaining people who intrinsically value their work: a characteristic expected of professionals.) We now turn our attention to the second class of intrinsic rewards: those that are intrinsic to the person.

***Intrinsic personal rewards*** are sometimes called "normative-affective rewards".[29] This describes their two central characteristics. They are "normative" in the sense that they relate to shared behaviors and practices valued by and accepted as appropriate by their

---

[28] http://greenfleet.dodlive.mil/energy/energywarrior/

[29] Etzioni, A., 1961.

group members, and they are "affective" in the sense that they are deeply emotional, evoking pride or guilt. Intrinsic personal motivation is evoked when people make choices that are connected to important personal values, purposes, and a sense of meaning. People feel pride in accomplishing goals related to these central values. They also are motivated to make progress toward such goals, so that leaders or technologies that provide feedback on energy efficient progress can be positive.

Research indicates that information feedback about energy usage helps people most effectively translate their intentions of energy efficiency into behavior. Thus even intrinsic task motivation is enhanced by external feedback that motivates their intrinsic sense of purpose and meaning.

Table 1 summarizes some of the systemic issues in this section in the form of a high level checklist. More specific questions would need to be shaped for the particularities and specifics of particular communities and units, with their own open systems dynamics, behaviors and action strategies, and cultural assumptions, values, norms and mindsets.

## ASSESSING ENERGY CULTURES

Organizational culture results from the systemic interaction of factors generated by policy decisions and implementations. It results from the sense people and groups make of the organizational environments created as a result of various policies. Figure 3 presents an image of the organizational open systems model we have used, but this time illustrates that the organization receives feedback from its environment and can thus adapt to and engage that environment. It again illustrates culture as moderating or intervening between the organizational policies, designs, and practices shaped by management and the effects and outcomes generated by the organization (e.g., mission accomplishment.) Figure 3 shows that leadership can help shape culture through its actions and communications, which is labeled symbolic leadership and sense giving.

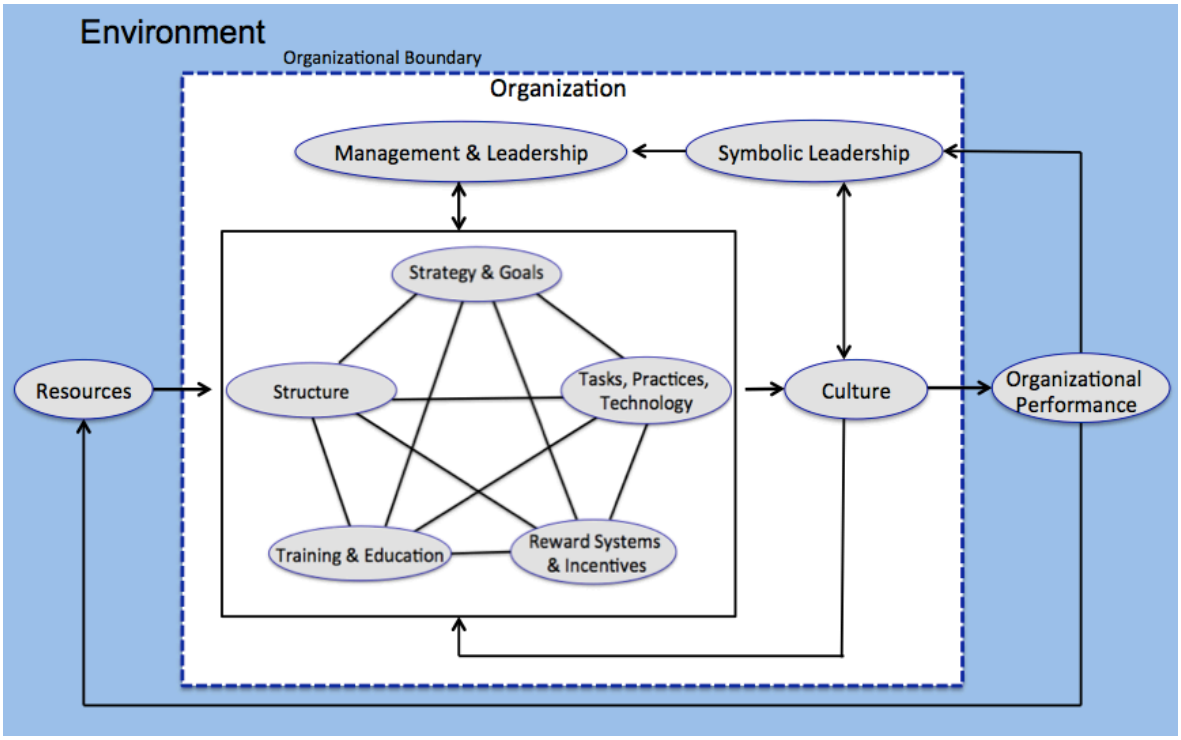


Figure 3: Culture viewed as Emergent Elements Co-Produced by Symbolic Leadership and by Management and Leadership Operating Through Five Policy Domains: An Open Systems, Organizational Design Framework

Assessing culture change is challenging because it requires assessing long-term, persistent behaviors and acquiring evidence that these behaviors are related to the deeper values and assumptions of individuals and groups. Because of leadership's critical role in culture change, it is important to assess perceptions of leadership practices; this includes strategic communication, goal setting, rewarding and approving desired behaviors (as well as disapproving and holding individuals accountable for undesirable behaviors), and the degree to which leaders develop and mentor their people. Figures 2 and 3 offer some sense of the domains and factors that should be assessed.

Table 1 presents a checklist of factors that we would expect to lead to energy efficient cultures, although there is little research on the degree to which these are all needed or how to sequence their implementation. The common wisdom among academics and practitioners is that culture change requires a systemic effort leveraging multiple factors in different policy domains, but some factors may be able to substitute to some degree for others. In any case, assessments should be systematic with respect to the content of a given culture change. In the case of energy, Table 1 presents an initial concept of what a self-assessment by an organization's leadership might look like with respect primarily to leadership behaviors.

***The Methodology of Assessing Energy Cultures.*** Methods of assessing an organization's cultures and subcultures can be thought of as ranging from the simple

behaviors to deeper attitudes, values, and assumptions. More superficial methods – like surveys – have an advantage in that they can be widely distributed to assess representative attitudes, beliefs and values. When cleverly written, they can be very revealing, but they are unlikely to surface specific assumptions in the language and from the perspective of those in the organization or unit being surveyed. Surveys don't readily allow emerging concerns, assumptions, or conflicts to be surfaced and expressed.

Ethnomethodology offers an alternative means of assessing culture, but it involves sending educated fieldworkers into the field to watch people's sayings, doings and practices with respect to their coworkers and technology.[30] Careful field observations and questioning are more likely to surface norms and assumptions that are at the root of strategic activities within specific contexts. They uncover narratives, stories, and metaphors that reveal deeper levels of sensemaking and interpretation. They are particularly useful for revealing the dynamics of culture's unfolding in terms specific to the units and thus are often most useful to leaders who need to take specific symbolic actions and craft messages that will resonate with their people and their work.[31] Because they require more intense involvement, fewer people can be approached than with survey feedback, and they risk being non-representative. It is possible to come away with a more negative or positive view than would be found with a more representative survey.

Careful field observations and questioning are more likely to surface norms and assumptions that are at the root of strategic activities within specific contexts.

Focus groups and interviews provide an intermediate level of information gathering, allowing for less behavioral observation in the context of people's actual work than ethnomethodology, but capturing interpretations that are richer in depth and meaning than surveys[32]. Whatever the methods, some information gathering and feedback of findings are generally required for organizational development.

## SUMMARY AND CONCLUSIONS

***A Systemic Organizational Design Approach to Culture.*** When management and leadership seek "culture change", an organizational design perspective frames this as a demand for more or less innovative technologies, tasks and practices. The culture change may demand that some individuals and groups take initiative and make commitments involving modified values and new ways of making sense of their world. As Figure 1 indicates, culture, and therefore culture change, involves sensemaking and shared assumptions, meanings, values, mindsets, perceptions and norms. Leadership affects

---

[30] Salem, A. & Gallenson, A., 2014.

[31] Salem, A. & Gallenson, A. 2014.

[32] Survey researchers are advised to design their surveys after doing some combinations of interviews and focus groups.

culture directly, through sensegiving: communications by word and deed that shape their people's sensemaking and the emergence of shared assumptions. An organizational design perspective also sees management and leadership as shaping culture through policy levers in the domains of strategy and goals, tasks, practices, and technology, organizational structures, and training, education, and reward systems. Culture emerges out of the complex interactions and active sensemaking that occurs as unique individuals in groups engage their technologies and each other to accomplish work goals in the content of the world created by management practices and policies.

***Policy Factors for Cultural Change.*** Although our analysis is certainly not exhaustive – indeed it represents an initial, first cut at these ideas in short order by a few people whose main task was to coordinate and create a GMT – we identified a set of policy domains and provided a checklist relevant to culture change. In this checklist and model (see Figure 2 and Table 1), we addressed twelve factors in the five policy domains for leadership to attend to:

1. Strategy and Goals
   - Strategic communications
   - Leadership actions on the purpose and goals
   - Resource investments
2. Tasks, Practices and Technology
   - Leading for joint optimization
3. Structure
   - Structuring roles and responsibilities
   - Structural flexibility
   - Collaborative structures
   - Organizational metrics
4. Reward Systems and Incentives
   - Extrinsic reward systems
   - Work design for intrinsic rewards
5. Training and Education
   - Training for compliance
   - Education for commitment and innovation

Without a systematic and persistent approach that integrates policies in multiple domains, the odds go down of moving beyond superficial behavior changes that produce, at best, compliance toward the commitments required for deeper culture change.

Strong initiatives in setting strategies and goals, in making resource investments, and strategically communicating to the force and its stakeholders is initially associated with leadership at the highest levels (i.e., the strategic apex) of the organizations and its diverse units. Leadership and its staff are largely responsible for organizational structures and the technologies and practices demanded by the organization. Overcoming resistance to change at the higher levels – getting compliance from those who are not yet judged by accomplishing energy goals and do not have energy in their portfolio of goals – is thus the first critical step. The human resource practices of executive and high-level management training begin here and cascade into lower levels and diverse sub-cultures.

Taking the changes through the workforce into the operational core (the "deck plates") of the various communities requires overcoming resistance to change. Much of this paper is about the need for systemic methods of change to overcome inertia and resistance. Overcoming resistance depends on the methods used to make the change, and without a systemic method we risk simply "rearranging the chairs on the deck". The changes are superficial and make no lasting impacts.

***Overcoming Resistance to Change.*** Overcoming resistance to change at the operational core or lower levels of the workforce requires:

- Abilities, skills and knowledge required to comply and, in some cases, take initiative and come up with innovative solutions,
- Motivation to change, which comes primarily from incentives and rewards, both extrinsic and intrinsic, and
- Role clarity about what is expected in their position in the organization.

***Developing Skills and Abilities through Training and Education.*** Abilities, skills and knowledge can be acquired on the job, but it clearly is also the province of training and education. One method our team examined for overcoming inertia and resistance is General Military Training. In working on a GMT, we encountered the general opinion among subject matter experts in strategic communication, education, and training, that a short, typical GMT is a misfit for innovative culture change and primarily serves to support compliance. Some subject matter experts expressed the opinion that cultural inertia and resistance to change might well be increased by required GMTs.

Another concern is the cost effectiveness of GMTs. If organizations are viewed as a group or set of individuals, then change would seem to mean changing all these people and a broadcast model of one-way communication to every individual might make sense. Culture and change involves a summation across individuals. A different view of organizations is that they comprise networks. These networks can be formal, involving individuals and groups who interact and communicate in terms of their interdependence involving goals, tasks, technologies, as well as authority and other role relationships. The networks can also be emergent and informal: friendship networks and informal information sharing networks (e.g., for seeking advice). In these dynamically interacting networks, some people are more central than others. Targeting change at opinion leaders within such networks may be an alternative to blanketing people with short GMTs more suited to compliance than commitment. (If the focus is really compliance, it may require more specific than general approaches to training. Specific behaviors may vary greatly in different communities and their subcultures.)

Change and innovation might best be thought of in terms of contagion models where ideas and practices spread through networks and interactions.

In short, change and innovation might better be thought of in terms of contagion models where ideas and practices spread through networks and interactions. Instead of targeting every individual, a network strategy would consider how change diffuses through the

organization; this includes taking advantage of the strength of the talented, hierarchical network of Navy leadership.[33] More innovative and extended training and education workshops or individual learning paths directed at select individuals might be a more cost effective use of resources than attempting to change the organization through a necessarily short, universal, standardized GMT experience.

***Motivating Performance through Reward Systems and Accountability.*** Perhaps the most critical factor for developing and sustaining an energy efficient culture throughout the rank and file of the Navy are reward systems and incentives. Motivation of energy efficient behaviors is necessary to overcome resistance to change, and without motivation, new behaviors and practices learned state of the art training are unlikely to persist in the workplace.

Well-designed reward systems incentivize desired behaviors rather than ignoring or punishing them. However, before desirable behavior can be rewarded, it must be identified, and before it can be identified, it must be defined. Defining desired behaviors requires setting goals on what is desirable. Identifying desired behaviors requires assessing behaviors and performance. Rewarding desired behavior involves attaching valued payoffs (e.g., greater probabilities of promotions, formal and informal recognition, or days off.) This process is generally associated with formal reward systems, but it also includes informal recognition by a boss. The reward system perspective also includes negative consequences involving disapproval and even punishment. Reward systems are ultimately control systems associated with accountability. While efficient energy practices should be met with recognition and rewards, wasteful energy practices should be met with disapproval and counseling. Shared rewards based on group accomplishments are especially likely to developed shared assumptions, meanings and perceptions associated with culture.

Culture is a complex phenomenon. It emerges as a complex, dynamic process that can be shaped not controlled.

Culture is often used as a catchall term, because culture is a complex phenomenon. The intuition is that it is a glue that holds everything together and is coherent with everything. It often enters into conversation ambiguously, with people agreeing that it must change or is a source of resistance and is the critical issue to be addressed. This paper has sought to make what are often intuitive and implicit assumptions about how to change culture more explicit.

In sum we have approached culture from an organizational design perspective. We have presented a short and necessarily superficial picture, arguing that it involves the social construction of appropriate behaviors, and includes shared values, shared norms, shared ways of thinking, shared perceptions, shared mindsets and shared meanings. It is, at its core, shared assumptions resulting in individual and collective sensemaking. It manifests

---

[33] This is already being done at the highest levels. NPS has been involved in the Energy Executive Education that seeks to generate commitment and leverages existing commitment among higher level, strategically placed commanders, leaders and managers.

in terms of the deepest attributes of individual identities, and what appears in what makes people proud or ashamed as they engage their work. Culture is produced by other factors, which can be viewed in terms of policy domains, and impact culture through goal setting, role expectations, technology and work practices, training, education, and formal doctrine, and in what actions are rewarded, approved, punished and disapproved, or ignored. All of this is shaped by management's policies and practices and by leadership's "sensegiving." Culture emerges as a complex, dynamic process that can be shaped but not controlled. More than others, managers and leaders shape culture, but they are not outside of it. The inertia of culture is everywhere around them and sometimes within them. Developing an energy efficient culture thus involves rich, complex, emerging, non-linear processes from leaders who must depend on other leaders, on subordinates, on peers, and on many stakeholders. Leadership in this domain requires participating in a complex, dynamic process that takes on a life of its own. We hope our models and checklists help organize some of this complexity so there will be a more systematic approach to this critical problem of energy efficiency.

Table 1: A Leadership Checklist for Energy Efficient Cultures

| I. Strategy and Goals |
|---|
| **1. Strategic Communication for Energy Efficiency (Leadership Communications)**<br>☐ The top leadership of units and organizations develop and communicate their plans and planning processes to support energy efficiency vision and goals. They collaborate where appropriate – internally and externally – to communicate and implement energy strategy, goals and priorities, and goals.<br>☐ Organizational members understand Navy energy goals and how their unit intends to support these goals. |
| **2. Leadership Commitment to Energy Strategy (Symbolic Leadership)**<br>☐ Leadership demonstrates its commitment to Navy energy policy, practices, and initiatives; it invests the time and energy necessary to make a difference. |
| **3. Resource Investments in Energy Efficiency**<br>☐ Resources are invested in facilities, equipment, and/or information technology to support energy efficiency. Resources are invested in training and education to better use existing and alternative energy technologies. |
| **II. Tasks, Practices, and Technology** |
| **4. Leading for Integrated Optimization of People and Technology**<br>☐ Leadership understands the challenges its people and groups face in implementing new practices. It consults with members, inviting participation when challenges arise and encourages new ideas and efficient practices. |
| **III. Structure** |
| **5. Structuring Roles, Responsibilities**<br>☐ Leaders have the necessary authority to restructure roles to improve energy efficiency. They provide guidance and invite discussions about decision-making and problem solving (e.g., tradeoffs involved) in being energy efficient and thus enhance combat effectiveness. |
| **6. Structural and Procedural Flexibility**<br>☐ There are opportunities for being flexible and responsive in adapting procedures and practices for more effective energy practices. There is flexibility to address the de-confliction of policies, processes and procedures that interfere with energy efficient practices. |

**7. Collaborative Structures for Energy Conservation and Innovation**

- ☐ Units and departments have roles for coordinating with other departments and units to advance energy goals. Members in key roles have strong work relationships across departments and units to collaborate to increase energy efficiency.
- ☐ Units and members share information; they publicize and exchange best practices; they create relationships, networks and communities to share knowledge. Units do not engage in competition and conflict that interferes with developing a culture of energy efficiency.

**8. Organizational Metrics for Energy Efficiency**

- ☐ There are measurement criteria and clear performance standards to evaluate the energy efficiency of systems and work processes; timely feedback to management and operational personnel are available (or being developed) to provide information on energy usage and progress toward meeting goals.

**IV. Training and Education for Energy Efficiency**

**9. Training for Compliance and Appreciation of Energy Efficiency**

- ☐ All individuals in the organization have been introduced to the importance of energy efficiency as a critical factor in combat effectiveness and mission accomplishment. They understand procedures for making recommendations to improve energy usage and the rewards and recognition that can and have resulted from such actions.

**10. Education for Commitment and Education**

- ☐ Leaders through the chain of command have received training on policies, doctrine, procedures, and expectations for leading energy efficiency efforts at their levels and for their communities. Leaders have access to education to develop more advanced levels of understanding; they have learned to apply their knowledge to the specifics of their organization's work systems, processes, and practices. They have access to tools (e.g., a Commander's Toolkit) for influencing and mentoring others on best energy practices.
- ☐ Personnel in critical positions – especially those with higher levels of training and education who are expected to make value-laden judgments and decisions -- have access to continuing education on how to introduce and champion energy initiatives. Their knowledge, skills and abilities are deployed to educate and mentor others who demonstrate exceptional promise and talent.

| **V. Reward Systems and Incentives for Energy Efficiency** |
|---|
| **11. Extrinsic Rewards**<br>☐ Critical performance and organizational metrics are tied to individual and group rewards. Promotion and career security are enhanced by becoming knowledgeable and making a difference with energy policies, systems, and practices. Personnel who master and make exceptional contributions to energy efficiency are valued by the organization.<br>☐ Leaders encourage and reward energy initiatives from subordinates, and these leaders are in turn rewarded and celebrated. |
| **12. Intrinsic Rewards**<br>☐ Work is designed and technology is deployed so individuals receive timely (ideally, immediate) feedback on energy related performances. Recognition and awards exist and are used to celebrate achievements, enhance reputations, and provide role models for others. |
| Jansen, E., Gallenson, A. C., and Higgins, S. L., Naval Postgraduate School, Monterey, CA, 2015 |

Appendix (A)

# TRAINING AND EDUCATION FOR CULTURE CHANGE: GENERAL MILITARY TRAINING VS. INDIVIDUAL LEARNING PATHS

This paper has been written in the context of considering issues of on-line training and education in the military. It began with a focus on culture changes for energy efficiency that might be produced by individual learning paths as they are being implemented in Massive Open Online Courses (MOOCs); our project eventually culminated in a project to design and develop General Military Training. It is in this context that we, in the sections above, discussed the larger context of culture change. In this section we examine some of our learning on issues of training and education in the context of GMTs and MOOCs. We look at this first by focusing more specifically on training as manifested in GMTs and on Education as manifested by individual learning paths and MOOCs.

## GMTS AND MOOCS: CHARACTERISTICS

GMTs are currently the only vehicle for delivering information to all personnel in the US Navy, civilian and military alike. They provide identical content to Navy members across vast distances, over diverse geographies, the institutional and organizational diversity. Because GMTs are highly standardized and serve large numbers of people, and because standardization and size typically lead to bureaucracy, it is not surprising that designing and delivering training within the GMT context is a highly structured bureaucratic process. As the name states, GMTs are training vehicles.

By contrast, the emergence of MOOCs have been described as a "perfect storm of innovation"[34] resulting from the development and diffusion of online technical systems, interest from teachers and their educational institutions, and the availability of volumes of digital materials and resources. Behind these innovations are engaged engineers, designers, educators, and managers who collaborate to create new educational experiences and opportunities. A generation of tech savvy learners needing to overcome availability and cost barriers are contributing to the current MOOC expansion. Given their explosive growth, it is not surprising that MOOCs have captured the attention and interest of those in the corporate training and education domains.. A Forbes correspondent writes that, "Incorporating MOOC concepts inside the organization will ultimately challenge the human resources and corporate learning departments to rethink and re-image their value proposition."[35] MOOCs are designed to serve as education vehicles.

---

[34] Atkins, D. E., Brown, J. S., and Hammond, A. L. A. 2007.

[35] Meister, J. How MOOCs will revolutionize Corporate Learning and Development. Downloaded Nov 30, 2014. http://www.forbes.com/sites/jeannemeister/2013/08/13/how-moocs-will-revolutionize-corporate-learning-development/

Table 2 presents some of the characteristics of GMTs and MOOCs. The primary lens or frame of reference that differentiates them is the distinction between training and education. Here we should issue a caution: MOOCs, unlike GMTs, are a recent and emerging innovation. There is little research on MOOCs. Nonetheless, we can make some general characterizations at this stage of their development.

Table 2: Attributes Associated with Training versus Education

| | **Training (e.g. GMT)** | **Education and Individual Learning Paths (e.g. MOOCs)** |
|---|---|---|
| Frame of Reference | Training; training to apply procedures and practice specific behaviors generally related to compliance. | Education; education for judgment, decision-making and problem solving. |
| Time Commitment | Minimal: generally an hour or less. | Moderate to High: generally several hours per week and multiple weeks. |
| Capacity & Scale | Large numbers: All individuals in the service. | Large numbers, hence "Massive". |
| Access & Criteria for Enrollment | Access to technical infrastructure is provided. Enrollment is bounded and exclusive to organizational members. | Individuals must acquire or arrange the means of accessing the technical infrastructure; Enrollment is open to all. |
| Primary Motivation for Involvement | Required (coerced); Typically extrinsic. | Voluntary; instrumental to personal career and work goals and/or of intrinsic interest and value. |
| External Consequences for Withdrawal | Messages that the training requirement is necessary followed by aversive consequences | None |
| The Most Positive Motivational Consequences of Participation & Completion | Increased Awareness of Expectations and Standards; Compliance | Increased Understanding, Knowledge, and Skills; increased motivation to learn & apply knowledge. Certificates of Completion. |
| The Most Negative Motivational Consequences | Resentment & frustration at coerced attendance and need to | Few or none because withdrawal is an available, |

| | | |
|---|---|---|
| of Participation & Completion | get regular work done. | non-aversive option. |
| Peer involvement and social learning | Minimal; usually none. | Peer appraisal and peer learning projects |
| Likelihood of Value Change and Commitment relevant to Culture Change | Minimum, increased awareness sensitizing the individual to other systemic changes. | Moderate or Higher: Possibilities for greatly heightened awareness and becoming a messenger for change. |

The information in Table 2 might be used (1) to inform judgments in designing a training/education program that incorporate a mix of appropriate features to fit the goals and context of training (i.e., compliance versus commitment, behavior change versus culture change). It can also be used (2) to think about what types of programs need to be delivered at what levels and in what parts of the organization. The most cost effective solutions might involve training at one level and education in others. Some education might exist to promote innovation and initiative in changing practices and implementing new technologies. In other places the requirements might be training on basic goals and expectations for behavioral compliance. (In the emerging mobile, internet context, many subject matter experts have indicated that social media and games could play a much more important a role as standardized training modules like the GMTs.)

In the emerging mobile, internet context, many subject matter experts have indicated that social media and games could play a much more important a role as standardized training modules like the GMTs.

As Table 2 indicates, GMT's are designed and administered in the context of training; they aim at getting trainees to learn and apply specific procedures and best practices that are important for the organization and its goals. These generally are not too demanding or complex. MOOCs by contrast are envisioned as providing an experience more akin to college classrooms (some of the most prestigious classrooms since MIT, Stanford, and Harvard are leading the way): a somewhat deeper education and understanding that results in a grounding for individual reasoning, sensemaking, judgment, problem-solving and decision making. This is reflected by the much greater time requirements of a MOOC, which vary in length but might run for six to ten weeks and expect five or more hours of work per week.

Both GMTs and MOOCs can be scaled to reach large numbers. GMT is a form of organizational training aimed at members of the Navy. Because the training is mandated by that organization, access to training is readily available to members. By contrast,

MOOCs are, as the acronym indicates, open to anyone who can acquire the resources for access.

GMT attendance is required, and there are negative consequences that result from failures to attend; in short, it is coerced. By contrast, there are no consequences for failing to attend MOOCs. Emails announcing new lectures will continue to arrive and invite participation. In the best of circumstances, GMTs are likely to result in increased awareness of expectations and standards, some modified simple behaviors, and individual compliance; they may also, through attentional processes, activate existing motivations of those who already hold positive attitudes. In the best of circumstances, MOOCs result in increased knowledge and understanding, in addition to skill development; because of their length, they may be more effective at shaping the integration of content and value formation. A sense of increased competence and purpose in turn fuels the intrinsic motivation to learn and apply knowledge.

Although there are differences between GMTs and MOOCs, they are both distance-learning technologies. Distance learning technologies have been developing for several decades now. There are thus best practices applicable to both. One of the most basic is to regard the training or learning modules as going beyond broadcast to include carefully crafted, text-based material and interactive opportunities. Video and PowerPoint lectures should not to be regarded as the dominant core of effective pedagogies.[36]

In sum, GMT is training that may, at its best, raise awareness and generate compliance; the increased awareness may reinforce *existing* commitment in the workforce. Individual Learning Paths (and perhaps future MOOCs) may, at their best, increase understanding and knowledge related to workforce professionalization and commitment. Individual Learning Paths that incorporate peer exercises and projects in longer learning experiences offer the possibilities of teaching new ways of thinking about energy conservation and building peer support for norms of energy efficiency. It is important to note that numerous subject matter experts have indicated that traditional GMTs are not likely to be a vehicle for even superficial culture change; they have even suggested GMTs might generate resistance and inertia toward change. Specifically, if individuals return from a GMT and complain about the training, then this may counteract the positive benefits that were desired, making training counter-productive. This suggests assessing effects of on-line training (GMTs) or education (Individual Learning Paths) is critical for determining cost-benefit estimates.

## TRAINING (GMTS) AND INDIVIDUAL LEARNING PATHS (MOOCS): ORGANIZATIONAL FIT

Organizational Theory – particularly Structural Contingency Theory – would suggest that different training models (GMTs vs. MOOCs or Training vs. Individual Learning Paths) might be appropriate in different types of organizations. Table 3 presents some hypothesized fit predictions based on structural contingency theory. It predicts that GMTs are more appropriate for relatively simple tasks or competencies involving simpler social, cognitive, or mechanical skills. (Simple work can be very demanding, requiring

[36] McAndrew, P. and Scanlon, E., 1450-1451.

energy, persistence, courage, and conscientiousness, but it likely requires less training and education than more complex work.) Training is more likely to provide "recipes" rather than an understanding that allows individuals to make judgments. It is thus a fit for organizations and units that expect their people to follow rules and standard operating procedures (SOPs) and back this up by direct supervision through the chain of command when there are exceptions. By contrast, higher levels of education are a fit for organizations that confront more complex tasks and competencies, including integrating information about people, data and more sophisticated engineering problems. Such organizations require their people to use their best judgment, and they thus require that their training and education meets standards, and they have earned the appropriate certifications, degrees, and licenses.

Table 3: Organizational Attributes Expected to Form a Fit for GMTs vs. MOOCs

| Organizational Attribute | Training (e.g. GMT) | Education and Individual Learning Paths (e.g. MOOCs) |
|---|---|---|
| Complexity of competencies expected/ Complexity of tasks to be accomplished | Most appropriate for relatively simple tasks and competencies requiring working simpler social and cognitive skills. (This does not mean they may not be difficult or demanding to execute.) | More appropriate for relatively complex tasks and competencies requiring higher-level cognitive and social competencies. |
| Dominant Modes of Coordination | Rules & standard operating procedures, backed up by direct supervision | Standardized skills, professionalization, & certification, backed up by mutual adjustment and lateral processes. |
| Organizational Part | All personnel but especially staff focusing on standardization (i.e., technostructure or technical structure) | All personnel, but especially operational core of the organization; those on the "front line". Anybody who has a more "professional" role where judgment and initiative is required. |
| Organizational differentiation | Tall; many levels in the hierarchy | Flat: few levels in the hierarchy |
| Organizational Decision Making | Centralized | Decentralized |
| Organizational Type | Machine Bureaucracy with embedded simple structures. | Professional Bureaucracy and Network organizations (Adhocracies) |

| | | |
|---|---|---|
| Proportion of Vertical vs. Horizontal Processes | Vertical modes of coordination – including following rules – tend to be dominant with some lower order horizontal modes of coordination | Horizontal (lateral) modes of coordination – liaisons, task forces, and matrix structures – are likely to be more common and even dominant. |

Organizations that rely on training tend to have relatively large staffs dedicated to creating rules, regulations, procedures, and, of course, standardized syllabi. They thus risk, especially if they become large, becoming inefficient with unnecessary layers of "red tape". They also tend to be tall with many layers of supervisors in a hierarchy. Decision-making tends to be vertically centralized, particularly under conditions of threat or resource scarcity when lower level participation may be reduced even more. By contrast, organizations that rely on higher levels of education from their operational core – again, to deal with more complex problems – decentralize decision-making. They expect operational personnel to exercise disciplined judgment and self-management. Seeking guidance from the hierarchy must be reduced in the face of complexity lest those at the top (center) be overloaded and information bottlenecked. Professional organizations are typically short, with perhaps three or four levels in the hierarchy.

In Summary, as Table 3 indicates, training tends to be a good fit for organizations that are close matches to the prototypical machine bureaucracy, whereas the individual learning paths characteristic of MOOCs are likely to be better matches for organizations that are closer to matching at least some characteristics of professional bureaucracies. Machine bureaucracies are dominated by vertical modes of control, while horizontal processes of coordination dominate professional bureaucracies. (In times of crisis and greater uncertainty, where bureaucracies are misfits, machine bureaucracies depend more on leadership (or the chain of command), and improvisational teamwork at all levels and SOPs are less important. In times of crisis, professional bureaucracies must also depend on leaders, but they also rely more on networks of teams. Thus in crisis and instability, machine bureaucracies continue to rely primarily on vertical processes and professional bureaucracies more on horizontal processes.)

To the extent an organization expects to be moving into environments where they will be confronted by more complex problems, then they may have good reason to push in the direction of education versus training.

Most organizations are not ideal matches to machine or professional bureaucracies, but are hybrids between these types. Those closer to the professional model deal with more

complex tasks and require more professionalized education, making MOOCs or individualized learning paths a likely best fit; those dealing with simpler, well-defined tasks are more likely to find training well suited to their needs. Thus, to the extent that energy best practices in a particular command require more complex competencies and problem solving, then MOOC like educational paths are hypothesized to be a better fit. To the extent that they are simpler and mainly involve compliance with rules and standard operating procedures, then simpler training may be satisfactory.

This logic also applies through the hierarchy. It may be the case that lower level personnel primarily need to follow simpler procedures (e.g., identify problems and know how to use a suggestion system; manage power requirements in their units according to standards in the context of specific technical feedback). If this is the case, then training is a cost-effective solution. However, at some level in their chain of command, more complex coordination and thinking will be required to design, develop, and implement energy solutions and initiatives. Thus higher-level personnel may more frequently require longer, individualized learning paths.

Creating a Commander's Energy Toolkit to supplement (or substitute) for training may be a far more persuasive way to communicate with the workforce and effect culture change.

To the extent an organization expects to be moving into environments where they will be confronted by more complex problems, then they may have good reason to push in the direction of education versus training, as this is more congruent with professionalizing their personnel, including the operational core. Obviously, this also will require other changes, most notably determining how to confront the conflict between centrally mandated rules, procedures and SOPs and the decentralized, professionalized judgment and initiative of operational personnel.

Finally and critically, if the work environment is incongruent with training outcomes, then transfer of training and education will not occur. Without supporting incentives to reinforce learned behaviors, money spent on training and education will most likely be wasted. Learning will not translate into performance.

## GMTS AND MOOCS: HYBRID FORMS

Table 3 presents characteristics of GMTs versus MOOCs. The promise of the classic or traditional MOOCs in Navy organizations might come in several ways. The first is viewed as changing basic design assumptions by opening training up to individuals outside of the organization's boundaries. Corporations are aware that the Internet can be used to extend the community of learners beyond the normal targets of employees (or internal members) to include those outside the organization's boundary. This would be in accord with organizational values of inclusiveness and openness that are likely associated with values of innovation, flexibility, and taking initiative. This solution requires determining the incentives – possibly quite different – that motivate internal versus external learners attending a MOOC. What rewards – intrinsic and/or extrinsic – would

organizational members receive for attendance? Would attendance be mandatory or voluntary? Would external learners be restricted to particular stakeholders of the organization or to a subset of relevant organizational problems? (Clearly, if knowledge is proprietary or involves practices conferring competitive advantage to an organization, then education cannot be open to all outsiders.)

Other alternatives involve enriching training to make it more effective. For example, entirely off-loading important messages and change initiatives – especially those involving cultural change – to an on-line GMT is likely to be far less effective than involving leadership through the chain of command. The chain of command and the strength of Navy leadership is a strong resource of the U.S. Navy. Thus creating a Commander's Energy Toolkit to supplement (or substitute) for training may be a far more persuasive way to communicate with the workforce and effect culture change than a traditional, stand-alone GMT. A Commander's Energy Toolkit might include sharing stories and concrete examples of ways that Commanders are choosing to use the Energy Efficient Culture Checklist at Table 1.

## BEST PRACTICES AND MOOCS

The following best practices – recast as questions – are offered by the forty year old The Open University of Britain which has experience enabling 1.6 millions people to complete courses[37].

1. Have multiple media – broadcasts or video, structured interactive tasks, carefully constructed supporting texts – been developed to work together?
2. Are there considerations for under-prepared students in terms of either on-line tutoring or semi-automated contact? Are analytics used to provide students feedback?
3. Are assessments carefully developed, including leading questions with answers that provide learning on what qualifies as good answers? Are analytics used to assess gains that are paired with feedback and recognition?
4. Is quality ensured by ensuring consistency of content and using multidisciplinary teams of media, design, and content specialists?

Because MOOCs are a new phenomenon, there is little research on how to best leverage what some in the training and education communities see as a potentially powerful new tool for education.

[37] McAndrew, P. & Scanlon, E. (2013).

## LIST OF REFERENCES


Atkins, D. E., Brown, J. S., and Hammond, A. L. A. *Review of the Open Educational Resources (OER) Movement: Achievements, Challenges and New Opportunities*. Menlo Park, CA: William and Flora Hewlett Foundation, 2007.

Canato, A., Ravasi, D., and Phillips, N. Coerced Practice Implementation in Cases of Low Cultural Fit: Cultural Change and Practice Adaptation During the Implementation of Six Sigma at 3M. *Academy of Management Journal* 56(6), 2013, 1724-1753.

Etzioni, A*., A Comparative Analysis of Complex Organizations.* NY: The Free Press of Glencoe, Inc., 1961

Galbraith, J.R. *Designing Organizations: An Executive Briefing on Strategy, Structure, and Process.* San Francisco: Jossey-Bass Publishers, 1995.

Gioia, D. A., and Chittipedi, K. 1991. Sensemaking and Sensegiving in Strategic Change Initiation. *Strategic Management Journal* 12, 1991, 433–448.

Jick, T.J. *Managing Change: Text and Cases.* NY: McGraw-Hill, 1993.

Kerr, S. On the folly of rewarding A while hoping for B. *Academy of Management Executive*, 1995, 9(1), pp. 7-14.

Kotter, J.P. *A Sense of Urgency*. U.S.: Harvard Business Press, 1996.

Lo, S. H., Peters, G-J Y. and Kok, G. A review of determinants of and interventions for proenvironmental behaviors in organizations. *Journal of Applied Social Psychology* 42(12), 2012, 2933-2967.

McAndrew, P. and Scanlon, E. Open learning at a distance: Lessons for struggling MOOCs. *Science*. 342. 20 December 3012, pp. 7-8.

Monge, P.R. and Contractor, N.S. *Theories of Communication Networks*. Oxford University Press. 2003.

Mowday, R.T., Porter, L/W. and Steers, R.M. *Employee-Organization Linkages: The Psychology of Commitment, Absenteeism, and Turnover*. New York: Academic Press, 1982.

Ogbonna, E., and Harris, L. Managing organizational culture: Compliance or genuine change? *British Journal of Management* 9, 1998, 273–288.

O'Reilly, C.A. & Chatman, J. (1986). Organizational Commitment and Psychological Attachment: the Effects of Compliance, Identification and Internalization on Prosocial Behavior. *Journal of Applied Psychology* 71(3), 1986, 492-499.

Salem, A. and Gallenson, A., *A study of human behavior and operational energy: analysis and recommendations for the Marine Corps to increase its operational reach*. Naval Postgraduate School report prepared for the U.S. Marine Corps Expeditionary Energy Office, Oct. 2014.

Schein, E. A. *Organizational Culture and Leadership.* (2nd Ed.). San Francisco: Jossey-Bass Publishers, 1992.

Sathe, V., *Culture and Related Corporate Realities*. Homewood, Ill: Richard D. Irwin, Inc., 1985.

Van Eijnatten, F. M., Shani, A. B., and Leary, M. M. Sociotechnical systems: Designing and Managing Sustainable Organizations. In Cummings, T.G. (Ed.) *Handbook of Organizational Development.* Thousand Oaks, CA: Sage Publications, pp. 277-309.

Westphal, J. D., Gulati, R., and Shortell, S. M. 1997. Customization or Conformity? An Institutional and Network Perspective on the Content and Consequences of TQM Adoption. *Administrative Science Quarterly* 42, 1997, 366–394.